

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (original): An athermal optical element comprising a silver chloride or cesium bromide surface having a surface figure of <200 nm.

Claim 2 (previously amended): An athermal optical element comprising a surface of a crystalline, cubic material with a surface figure of <200 nm, said material having an index of refraction, n , and a coefficient of expansion, α , such that:

$$dn/dT = -n\alpha_1$$

wherein T is temperature.

Claim 3 (original): An optical element of claim 1 wherein said silver chloride or cesium bromide surface is coated.

Claim 4 (original): An optical element of claim 3 wherein said coating is an antireflection, index adjusting, filter, or interference coating.

Claim 5 (original): An optical element of claim 1 which is permanently affixed to a substrate by an adhesive which is not UV cured.

Claims 6-14 (cancelled)

Claim 15 (currently amended): An athermal, optical composite material comprising a number of layers, m , at least two layers having [of] different compositions and different values of dn/dT , wherein the total optical pathlength, nL , across all of said layers m is essentially independent of temperature; [and] the optical parameters of said layers satisfying the equation

$$\sum_{i=1}^m L_i (dn_i/dT + n_i \alpha_i) = 0$$

[wherein n] where m is [index] the number of [refraction, L] layers, L_i is the [total] thickness of the i^{th} [layers, T is] layer in the direction of optical use, n_i and α_i are the refractive index and thermal expansion of the material making up the i^{th} layer and dn_i/dT is the variation of refractive index of the material making up the i^{th} layer with temperature T , and at least two of said values of dn/dT have opposite signs.

Claim 16 (original): A composite material of claim 15 wherein each of said layers comprises a glass composition, a crystalline material or a polymeric material.

Claim 17 (original): A composite material of claim 15 wherein said layers are glass/crystalline, glass/polymeric or polymeric/crystalline composites.

Claim 18 (original): A composite material of claim 17 having a surface with a surface figure of <200 nm.

Claims 19-29 (cancelled)

Claim 30 (original): An athermal, optical composite material comprising at least two layers of different compositions, wherein the total optical pathlength, nL , across said two layers is essentially independent of temperature; and wherein n is index of refraction, L is the total thickness of the layers, and T is temperature.

Claim 31 (original): A composite material of claim 30 wherein each of said layers comprises a glass composition, a crystalline material or a polymeric material.

Claim 32 (original): A composite material of claim 30 wherein said layers are glass/crystalline, glass/polymeric or polymeric/crystalline composites.

Claim 33 (original): A composite material of claim 32 having a surface with a surface figure of <200 nm.

Claim 34 (original): An optical element comprising a silver chloride or cesium bromide surface having a surface figure of <200 nm.

Claim 35 (new): An optical element of claim 1 wherein said surface is sufficiently large to function as a demultiplexer.

Claim 36 (new): An optical element of claim 1 wherein said surface is exposable to air.